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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/716,495 | 11/20/2003 | Yoshiharu Doi | 65933-052 | 6689 |

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| EXAMINER |
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ODOM, CURTIS B

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| ART UNIT | PAPER NUMBER |
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2611

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 01/04/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/716,495

Applicant(s)

DOI, YOSHIHARU

Examiner

Curtis B. Odom

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-15 and 17-24 is/are rejected.
- 7) ☒ Claim(s) 8 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because in claim 1 “BB” is suggested to be changed to “Baseband”. Correction is required. See MPEP § 608.01(b).

Claim Objections

2. Claims 2 is objected to because of the following informalities:
 - a. In claim 2, line 1, “includes” is suggested to be changed to “including”.Appropriate correction is required.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
4. Claims 17-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 17-24 recite a computer program without a computer readable medium. MPEP 2106.01 [R-5], Section I states the following:

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical “things.” They are neither

computer components nor statutory processes, as they are not “acts” being performed.

Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program’s functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program’s functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 5, 7, 9, 10, 13, 15, 17, 18, 21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Yukitomo et al. (U. S. Patent No. 6, 191, 736).

Regarding claim 1, Yukitomo et al. discloses a receiver (Fig. 2) including:

an input unit including plural antennas (Fig. 2, elements 101, see column 2, lines 63-67)

which inputs a plurality of signals on which a processing is to be performed;

a switching unit (see Fig. 2, block 105, see column 3, lines 13-18) which switches a plurality of weighting coefficients by which the plurality of inputted signals are multiplied (see Fig. 2, elements 107 and 108) between a plurality of first weighting coefficients (see Fig. 2, block 103) to be temporarily utilized and a plurality of second weighting coefficients (see Fig. 2, block 104) which have higher adaptabilities (see Abstract, column 4, lines 22-37 and column 4, line 66-column 5, line 9, wherein the second weighting coefficients are adapted to the rapid changes in channel quality);

a controller (not shown) which instructs the switching unit with a propagation path switching instruction signal (see column 3, lines 13-18) to switch the weighting coefficients between the plurality of first weighting coefficients and the plurality of second weighting coefficients; and

a synthesizer (Fig. 2, block 109, see Abstract and column 3, lines 46-50) which synthesizes results of multiplications, where the multiplications are performed on the plurality of inputted signals and the plurality of weighting coefficients (see Abstract).

Regarding claim 2, Yukitomo et al. discloses a receiver (Fig. 2) including:

an input unit including plural antennas (Fig. 2, elements 101, see column 2, lines 63-67) which inputs a plurality of signals on which a processing is to be performed;

a switching unit (see Fig. 2, block 105, see column 3, lines 13-18) which switches a plurality of weighting coefficients by which the plurality of inputted signals are multiplied (see Fig. 2, elements 107 and 108) between a plurality of first weighting coefficients (see Fig. 2, block 103) to be temporarily utilized and a plurality of second weighting coefficients (see Fig. 2, block 104) which have higher adaptabilities (see Abstract, column 4, lines 22-37 and column 4,

line 66-column 5, line 9, wherein the second weighting coefficients are adapted to the rapid changes in channel quality);

a controller (not shown) which instructs the switching unit with a propagation path switching instruction signal (see column 3, lines 13-18) to switch the weighting coefficients between the plurality of first weighting coefficients and the plurality of second weighting coefficients in prescribed time slot intervals (see column 4, lines 15-45, wherein time slot 300 is multiplied by the first weighting coefficients and time slot 302 is switched to the second weighting coefficients (see column 4, lines 37-45), wherein the plurality of signals are inputted in a sequential slots during the interval (see Fig. 4); and

a synthesizer (Fig. 2, block 109, see Abstract and column 3, lines 46-50) which synthesizes results of multiplications, where the multiplications are performed on the plurality of inputted signals and the plurality of weighting coefficients (see Abstract).

Regarding claim 5, Yukitomo et al. discloses the plurality of first weighting coefficients is set by utilizing the plurality of second weighting coefficients (see column 4, lines 50-55) which have already been calculated (see column 4, lines 38-41).

Regarding claim 7, Yukitomo et al. discloses the signals inputted during the prescribed interval (slots) in the sequential manner include signals having different direction of arrivals (see column 4, lines 21-30), and wherein the controller instructs to switch the weighting coefficients between the first weighting coefficients and the second weighting coefficients when it is detected where the direction of arrival of the signals change due to a change in channel quality (see Abstract and column 4, lines 22-34).

Regarding claim 9, the claim method includes limitations corresponding to the above rejection of claim 1, which is applicable hereto.

Regarding claim 10, the claim method includes limitations corresponding to the above rejection of claim 2, which is applicable hereto.

Regarding claim 13, the claim method includes limitations corresponding to the above rejection of claim 5, which is applicable hereto.

Regarding claim 15, the claim method includes limitations corresponding to the above rejection of claim 7, which is applicable hereto.

Regarding claim 17, the claim includes limitations corresponding to the above rejection of claim 1, wherein claim 1 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Regarding claim 18, the claim includes limitations corresponding to the above rejection of claim 2, wherein claim 2 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Regarding claim 21, the claim includes limitations corresponding to the above rejection of claim 5, wherein claim 5 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Regarding claim 23, the claim includes limitations corresponding to the above rejection of claim 7, wherein claim 7 discloses a method/apparatus that can be executed by a computer, which is applicable hereto.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 4, 11, 12, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukitomo et al. in view of Kimata et al. (US 2002/0190900).

Regarding claims 3, 4, 11, 12, 19, and 20, Yukitomo et al. does not disclose the plurality of first weighting coefficients is set in a manner that, as results of multiplications by the plurality of inputted signals, a multiplication result corresponding to one signal among the plurality of inputted signals becomes effective, wherein the one signal among the plurality of inputted signals is a signal having a largest value among the plurality of inputted signals.

However, Kimata et al. also discloses an adaptive antenna array system including setting a plurality of initial (first) weighting coefficients such that as a result of the multiplications one signal will be multiplied by the initial weights by setting a corresponding weight controller with the initial weights, wherein the one signal corresponding the multiplication has the largest SIR value (see section 0068). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to set the first (initial) weighting coefficients in Yukitomo et al. as disclosed by Kimata et al. since Kimata et al. states setting the weighting coefficients in this manner obtains directivity with good receiving quality (see section 0069).

9. Claims 6, 14, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yukitomo et al. in view of Bottomley et al. (U. S. Patent No. 6, 801, 565).

Regarding claims 6, 14, and 22, Yukitomo et al. discloses a weighting coefficient updating unit (see Fig. 2, block 104) which updates a plurality of third weighting coefficients stored in memory (see column 3, lines 9-13) adaptively based on the plurality of inputted synthesized signals (see column 7, lines 4-22); and a gap (error) compensator which generates the plurality of second weighting coefficients by compensating the plurality of third weighting coefficients in memory (see column 3, lines 9-13) based on an estimated error (see column 7, lines 4-22). Yukitomo et al. does not disclose a gap (error) estimator which estimates gaps between the plurality of first weighting coefficients and the plurality of third weighting coefficients by performing a correlation processing between at least one of the plurality of inputted signals and a known signal.

However, Bottomley et al. discloses a error (gap) estimator which estimates gaps (error) for a plurality of initial (first) weighting coefficients in order to obtain a plurality of updated (second) weighting coefficients (see column 14, lines 10-19) by performing a correlation (comparison) processing between at least one of the plurality of received signals and a known signal represented by a pilot signal (see column 14, lines 20-36). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to estimate error (gaps) and update the third coefficients to produce updated second coefficients in Yukitomo et al. as disclosed by Bottomley et al. since Bottomley et al. states these updated weighting coefficients can be used for interference suppression (see column 6, lines 17-21).

Allowable Subject Matter

10. Claims 8 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

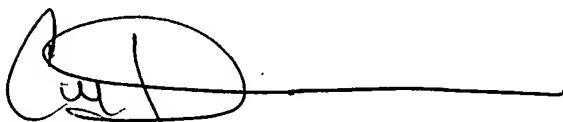
11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rabenstein (U. S. Patent No. 4, 912, 667) discloses switching between sets of coefficients.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Curtis Odom', followed by a long horizontal line extending to the right.

Curtis Odom
January 1, 2007